Repercussion of Foreign Animal Diseases

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Foreign or exotic animal and plant diseases can produce economic, environmental, and cultural devastation, as was illustrated in Dr. Ron Porter's excellent review of what is occurring with Mad Cow Disease in the United Kingdom (*Pulse Bulletin*, May 1996). Mad Cow Disease has destroyed Britain's ability to export livestock. In April of 1996, Britain announced plans to destroy about 1,500 older dairy cattle each week for over six years. A cultural effect is the dramatic reduction in beef consumption in Britain.

In the fall of 1993, a report issued by the Institute of Medicine, National Academy of Sciences warned that society had become too complacent in believing that the war against infectious diseases has been won. The risk of foreign animal disease entering Southern California is increasing as society becomes more mobile. Last year, more than 56 million people arrived in the United States from foreign destinations. Los Angeles County is one of three principal ports of international entry for California with both an international airport and two seaports. More than 99 percent of the live animals imported into Los Angeles County come through the Los Angeles International Airport. The US Fish and Wildlife Services estimates that 100,000 birds are smuggled into the United States every year with only one percent confiscated. There are approximately 500 parrots smuggled into Los Angeles County every month. Circus animals arrive through San Pedro Harbor. With the advent of the North American Free Trade Agreement and the World Trade Organization, there is a drive to lower trade barriers, resulting in the arrival of more animals and agricultural products by air, sea and land. During the first six months of 1995, the United States Department of Agriculture and State departments of agriculture conducted 88 investigations of suspicious foreign animal diseases to eliminate the possibility that an exotic disease could have been introduced.

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A foreign animal disease outbreak could cause considerable suffering for wildlife. Controlling the spread of disease in wildlife might be much more difficult than controlling its spread in domestic animals. Wildlife could spread the disease further and perhaps act as a reservoir which could not be eliminated. In 1993, there was evidence of three reportable diseases (trichinosis, vesicular exanthema, and pseudorabies) in wild pigs on Catalina Island. Hunters returning to the mainland may return with infected carcasses. There is no treatment for pseudorabies and, except in pigs, it is fatal in virtually all domestic animals that become infected. Before the 1900s, rabies in California was not detected, but today, rabies is endemic in California wildlife. The first confirmed case in Los Angeles was in 1898 when an English gentleman, living close to the intersection of Third and Flower Streets, informed the health officer that his dog seemed unexplainably nervous and uncontrollable and might have rabies. Four or five other rabid dogs were reported to the health officer within the next few weeks. Interestingly, Los Angeles County's last rabid cat was an international traveler, arriving at our international airport from Mexico in 1987. Within 48 hours after arrival, rabies was alertly diagnosed by a private veterinarian. Follow-up, after the immediate diagnosis, revealed that 23 people were exposed, three of whom were bitten by the cat. Two local cats were exposed and placed under a six month quarantine.

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Table 1
Federal agencies which regulate animal imports through Los Angeles County

NAME	FOCUS
United States Department of Agriculture – APHIS	Livestock
U. S. Fish and Wildlife Protection Service	Wildlife, endangered species
Treasury Department Customs Service	Animals – hold for specific agency
Public Health Service – Division of Quarantine	Cats and dogs, zoonoses

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Animal Disease Control

Four different Federal regulatory agencies are involved with importing animals into the United States (Table 1). Once animals have entered the United States and are in California they become subject to California regulations. Wildlife diseases are handled by California Department of Fish and Game. The California Department of Health Services focuses on regulating human disease and zoonoses while the California Department of Food and Agriculture focuses on livestock disease. Somewhat differently, Los Angeles County has combined both animal and human disease regulation within the Department of Health Services. The Los Angeles County Agriculture Commissioner focuses on plants. If diseased animals entering Los Angeles County present a threat to the animal population, the Board of Supervisors has authority to regulate these animals. Practitioners aware of foreign animal diseases are to report them to the appropriate agencies.

Tuberculosis Wiped Out in Cattle Returns

In the early 1900s, bovine tuberculosis was rampant in the United States and accounted for half the human tuberculosis fatalities. One study found that 66 percent of fatal human tuberculosis was due to *Mycobacterium bovis.* Due to extensive disease control measures started in 1924, Los Angeles County was finally free of tuberculosis in cattle. With the importation of Mexican cattle for slaughter, we are reintroducing bovine tuberculosis. The increase in bovine tuberculosis is not unique to Los Angeles County. In 1992, there was an 83 percent increase of bovine tuberculosis detected in cattle slaughtered, all of which were traced to Mexico.

Foot and Mouth Disease Arrives

An understanding of the impact of foreign animals disease came to Los Angeles County in 1924 when more than 10,000 animals died. The loss of livestock, control efforts and the impact of embargoes placed on California products cost the community millions of dollars. That year in Los Angeles County, there were 470 quarantine guards

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assisting the police department in the enforcement of the quarantine using 13 motorcycle patrols and 12 car patrols. A Long Beach oil worker was shot by a livestock quarantine guard one evening for failure to halt in a restricted area. This experience crystallized the community's understanding of the value of disease control and prevention.

Five years later, the last epidemic of foot-and-mouth disease in the United States occurred in Los Angeles County in January 1929 and was traced to infected garbage from a ship that docked in San Pedro. Forty-five days later, the outbreak was completely eradicated with less spread than any previous outbreak in the United States. The cost to the County was slightly in excess of $13,000, which was less than six percent of the control costs for the 1924 epidemic.

Canada experienced an outbreak of foot and mouth disease in the winter of 1951 which resulted in the slaughter of about 2,000 animals. In 1987, an analysis was conducted to see what the impact would have to a similar outbreak 35 years later. That study concluded that eradication costs would be approximately $2 million and due to international embargoes, the economic impact would be approximately $2 billion.

California Disease Spreads Nationwide

Vesicular exanthema of swine is an acute, highly infectious disease originally found only in California. Nearly all past outbreaks have occurred in swine fed raw garbage and

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cooking garbage is the most effective procedure to prevent the disease. Garbage-cooking began in Los Angeles County in 1926. Cooking of pork for human consumption is recommended for trichinosis control. A major concern of vesicular exanthema is that it is indistinguishable from food and mouth disease.

Suddenly in 1952, vesicular exanthema spread throughout the United States and within months outbreaks had been reported in 42 states and the District of Columbia. Investigation revealed that trains leaving California were the source of the national epidemic. Trains from California stopped periodically and dropped off their contaminated garbage. The infected garbage was then picked up at various train stations and fed to swine. Once the disease spread, other localities enacted garbage-cooking laws and a national eradication program was started. In 1959, the nation was declared free of the disease and vesicular exanthema was then designated a foreign animal disease, therefore reportable to the State and Federal government. In 1972, the causative virus was isolated from California sea lions during an outbreak of premature parturition on San Miguel Island, California.

The continued outbreaks indicate we have not conquered infectious diseases and we must maintain an epidemic battle plan focused on contagious diseases to reduce our future health care costs.

Once eliminated in Los Angeles County, it has reappeared in European wild boars on Catalina Island. One study indicated that 53 percent of the swine had antibodies to the disease. It is possible that the wild boar obtained the virus from feeding on dead marine life washed up on shore.

1971 Venezuelan Sleeping Sickness

An epidemic of Venezuelan equine encephalomyelitis (VEE) erupted in the United States 25 years ago, in July of 1971. The explosive epidemic was traced to a 1970 outbreak in Costa Rica which traveled over 4,000 kilometers in two years (5 kilometers/day) and entered south Texas along the Rio Grande River, killing approximately 1,500 horses. Human outbreaks follow outbreaks in horses and typically end when the outbreak in horses ends. During the two year spread in Latin America, there were thousands of human cases with children most often afflicted.

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To control the epidemic, the United States declared a national emergency and horses in California and five other states were vaccinated to establish a coast-to-coast barrier against the northward spread of Venezuelan equine encephalomyelitis. The United States Army released stockpiles of an attenuated live strain vaccine developed for protection of troops in case of biological warfare and the vaccination of horses in border States became mandatory. Two months later, more than 98 percent of the horses (50,600) in Los Angeles County had obtained their mandatory vaccination.

1972 - Another National Disease Emergency

1972 brought military troops into southern California to assist the local, state, and federal government in controlling another explosive epidemic. In April, 40 military veterinarians and 160 non-commissioned officers moved in. Before it was over, 10 million Los Angeles County birds died during the eradication of exotic Newcastle disease.

Common Canine Disease Finds New Host

Even common animal diseases of one species can mutate and jump the genetic barrier into other species creating entirely new epidemics which may go on indefinitely. In Los Angeles County, the world's first canine distemper epidemic in cats occurred in 1992, while the world's second began in Tanzania's Serengeti National Park in 1994. After the African epidemic had run its rapid course, one third of the lion population (2,000 lions) were dead. If this highly contagious virus gets into our domestic cat population, it is estimated that within two years 20 percent of the domestic cats will die with direct control costs of over $82 million. Indirect costs are estimated at five to 10 times the direct costs.

Future Implications

Los Angeles County alone has a domestic animal population of more than 10 million. Given the substantial impact of foreign disease, we must maintain our effective policies for prevention and control. This involves maintaining surveillance, regulations and diagnostic services. Disease however, does not give warning when it will strike. Outbreaks are not planned and we must plan beforehand if we hope to succeed and also keep down our health care costs. Unfortunately, this vital work behind the scenes can be overlooked when inexperienced people focus on the immediate. An effective animal disease control program was initiated in Los Angeles County in 1897 when the powers and duties of the Livestock

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Inspector's office were developed. The continued outbreaks indicate we have not conquered infectious diseases and we must maintain an epidemic battle plan focused on contagious diseases to reduce our future health care costs. Just as the fire department has learned, it is more exciting to the press to cover fires than to focus on fire prevention. With prevention, fewer and fewer fires occur. This is not to say that the need to focus on prevention should be reduced. Another important aspect of prevention is heightened awareness within both health professionals and the community.

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